NOTE XXXVI.

ON THE HEDGEHOGS FROM MADAGASCAR.

BY

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Mivart [1]) in a very interesting paper has pointed out the resemblances and differences between the skeleton and dentition of the genus *Centetes* and *Hemicentetes*. But it seems that he has confounded the two species which were known as belonging to the genus *Hemicentetes*, for he describes and figures very exactly the different parts of the skull and skeleton of *Hemicentetes variegatus*, Et. Geoff. St. Hilaire, under the name *Hemicentetes madagascariensis*, Shaw, — notwithstanding these two species present great differences in external characteristics and also in dentition, that is to say in the mutual proportions of the teeth.

As in so many other parts of Natural History there exists a very great confusion in the names given by the different authors to the various species of Hedgehogs from Madagascar.

It therefore seems not superfluous to trace the history of their synonyms.

But I will first remind the reader, that the various Madagascar species of Hedgehogs present the following *external* characteristics: there is a species resembling our common European *Erinaceus*, but belonging to another

1) P. Z. S. L. 1871, p. 58, pl. V.

genus; the other species resemble young tailless Porcupines, and among them we may distinguish three species, the first shows *nowhere* trace of longitudinal lines; the second bears *three* white bands on the back, the middle of the head being *also* provided with a white streak; while the third species is ornated with *five* white lines on the back, *without* white streak on the head.

Flacourt [1]) relates: il y a une espèce de *porcespy* que l'on nomme *Tendrac* (*Tendiac* in the very bad illustration), les gens du païs en sont fort friands tant les Roandries que les Negres: mais pour moy je n'en ay jamais peu manger. Ils sont tousieurs fort gras, leur chair est fade, longue et molasse. Ils dorment six mois, pendant lesquels il ne mange point, et pour cet effect s'enterrent assez avant en terre: cependant qu'ils dorment leur poil tombe, et il en renaist d'autre quand ils se reveillent. Ils foisonnent beaucoup; leur poil est aussi picquant que celuy du Herison. Il y a quantité de Herisons ainsi qu'en France, qu'ils nomment *Sora*."

Now it is evident that *Sora* is the species resembling externally the *Erinaceus europaeus*. But who shall make out what Flacourt meant with his *Tendrac*? Did is belong to the genus Centetes or to Hemicentetes?

Buffon [2]) described and figured s. n. *Tendrac* and *Tanrec* two Hedgehogs from Madagascar, *without* streaks on the back, the *Tendrac* measuring about 16 c. m., the *Tanrec* about 21 c. m. According to Buffon the *Tendrac* resembles the "common Hérisson;" the *Tanrec*, on the other hand, having a much more pointed muzzle, a kind of elevated crest on the neck, e. s. o., belongs thus to another group or species.

Afterwards [3]) Buffon figured another Hedgehog s. n. *le jeune Tanrec*, measuring about 11 c. m., and embellished with *three* white streaks on the back: and in the descrip-

1) Histoire de la grande isle Madagascar. 1661, p. 152, pl. fig.
2) Histoire naturelle, T. XII, 1764, p. 440, figs. LVI et LVII.
3) Histoire naturelle, Supplément, T. III, 1776, p. 214, fig. XXXVII.

tion he states "la première de ces bandes s'étend depuis le museau *tout le long de la tête* et continue sur le cou et sur l'épine du dos: les deux autres bandes sont chacune sur les flancs." The subjoined figure being very exact and the description very clear, it is rather inconceivable how Buffon could believe this specimen to be the young of the above named Tanrec.

The specimen [1]) figured s. n. *le Tandrac*, Buffon regarded as a young of his *Tendrac*, earlier described, whereas it was a very young specimen, or variety — measuring about 5.8 c. m. — of his *jeune Tanrec*, as will be seen in reading his description: "le corps porte une grande quantité de piquans d'un blanc jaunâtre, qui semblent se réunir par *bandes* irrégulières. On remarque *au-dessus du nez* une bande d'un blanc jaunâtre, qui s'étend jusqu'au commencement du dos et se termine en pointe à ses deux extrémités."

Schreber [2]) called *le Tanrec*, Buffon, and *le jeune Tanrec*, Buffon, *Erinaceus ecaudatus*, taking these two species for the same. But as they belong to two different species, as I have shown, we must the species-name "ecaudatus" apply only to the first species. He [3]) named *le Tendrac*, Buffon, *Erinaceus setosus*.

Sonnerat [4]) figured s. n. *le petit Tandrek de Madagascar*, a Hedgehog — measuring about 19 c. m. — with *five* white streaks on the back. This specimen belonged to another species and *not* to *Erinaceus setosus*, Lin. Gmel. [5]), the "setosus" bearing no streaks at all. The latter author followed Schreber in confounding *le Tanrec*, Buff. et *le jeune Tanrec*, Buff., under the name of *Erinaceus ecaudatus*.

1) Histoire naturelle, Supplément, T. VII, 1789, p. 301, fig. LXXVI.
2) Die Säugethiere, 1778, T. III, p. 584, pls. CLXV and CLXVI.
3) Die Säugethiere, 1778, T. III, p. 583, pl. CLXIV.
4) Voyage aux Indes orientales et à la Chine, 1806, 2me éd. T. IV, p. 118, pl. 91.
5) Systema naturae. 1788, 13th ed: T. I, p. 117.

Shaw [1]) called *le petit Tandrek*, Sonnerat, *Erinaceus Madagascariensis*, at the same time keeping together almost all the described Hedgehogs from Madagascar under that name: more especially however having in view in that description Sonnerat's Hedgehog. We therefore consider this *five* streaked Hedgehog as *Erinaceus madagascariensis*. I agree with Shaw in keeping distinct Buffon's *Tanrec*, not however as a variety as he did [2]).

Et. Geoffroy St. Hilaire [3]) admitted two species: the first was the *Setiger setosus* (Erinaceus setosus, Schreber) and the second species was a Hedgehog with *three* white streaks on the back, which he named *Setiger variegatus*, and thus being *le jeune Tanrec*, Buffon. — These species were brought with by Sonnerat.

Erinaceus (*Centenes*) [4]) *semispinosus*, Cuvier [5]) is a synonym of *Setiger variegatus* as being based upon *le jeune Tanrec*, Buffon. Cuvier rightly observes that this species presents six incisives in each pair of jaws.

Centenes spinosus, Desmarest [6]) is *Setiger setosus*, Geoff., as the description also shows.

The new genus *Ericulus* established by Is. Geoff. St. Hilaire [7]) is based upon a Hedgehog with "incisives au nombre de *quatre* à chaque mâchoire," and therefore agrees with *Setiger*, Et. Geoffr. St. Hilaire, the latter generic name thus having the priority.

Echinops Telfairi, Martin [8]), presents the snout, ears, tail, and spiny covering of the upper surface of the body,

1) General Zoology, 1800, Vol. I, T. II. p. 548.

2) General Zoology, 1800, Vol. I, T. II, p. 549.

3) Catalogue des Mammifères, 1803, p. 72.

4) According to Cuvier this genus-name should have been given by Illiger, but Illiger in his "Prodromus, 1811, p. 124", has established the genus *Centetes*, in favor of *Erinaceus ecaudatus*, Lin. Gmel.

5) Le règne animal, 1817, T. I, p. 166.

6) Mammalogie, 1820, T. I, p. 162.

7) Annales des sciences naturelles, 1837. Seconde Série, T. VIII, p. 60 (4 Septembre).

8) P. Z. S. L. 1838, p. 17.

as in *Erinaceus*, but the incisors in the *upper* jaw are four in number, and therefore this species entirely agrees with *Setiger setosus*, which generic and specific name is the oldest. — Wagner [1]) has changed the generic name *Echinops* to *Echinogale*. For the same reason *Ericulus nigrescens*, Is. Geoff. St. Hilaire [2]) also is *Setiger setosus*, or perhaps a black variety of latter. *Centetes armatus*, Is. Geoff. St. H. (o. c) agrees with the true *Centetes ecaudatus*, whilst his *Centetes setosus* (o. c.) was a young specimen of *Erinaceus madagascariensis* Shaw, as the figures clearly demonstrate.

In "Notes sur les Mammifères, etc.", A. Grandidier [3]) enumerates among two other species (viz: *Centetes ecaudatus*, L. and *Ericulus nigrescens*, Geoff. = black variety of *Setiger setosus*) also *Ericulus spinosus*, Illiger. As I mentioned above, Illiger has invented the generic name *Centetes*, and moreover emplayed only the specific name *ecaudatus*, Lin. Gm. Perhaps Grandidier meant *Ericulus spinosus*, Is. Geoff. St. H., but this specific name (the species was based upon specimens in a very bad state of conservation) is synonymous with *Ericulus nigrescens*, Geoff. (see the description apud Geoffroy, o. c.). *Echinops Mivortii* [4]), Grandidier, or *Echinops Miwarti* [5], Grandidier, apparently belongs to the black variety of *Setiger setosus*.

Pollen and v. Dam [6]) have gathered specimens, some *with* and others *without* white lines on the back, they however state that the former were young specimens of the latter — viz: of *Centetes ecaudatus*. — Is. Geoffroy St. Hilaire, o. c. says "les jeunes individus de cette espèce, (du *Centetes setosus*, Cuvier = Erinaceus *madagascariensis*, Shaw) diffèrent considérablement des adultes. J'ai sous les yeux plusieurs

1) Die Säugethiere Schreber's, Supplementband, II, 1841, p. 29.
2) Magasin de Zoologie, 1839, deuxième Sérïe, p. 1 et sqq. pls. 1 à 4.
3) Revue et Magasin de Zoologie, 1867.
4) Bulletin de la Société de Géographie, 1871.
5) Revue et Magasin de Zoologie, 1869, p. 338.
6) Recherches sur la faune de Madagascar, 1868, 2me partie, p. 25.

Tanrecs long seulement de quatre pouces — 10.8 c. m. —: leur corps est, en dessus, noir, avec *cinq* bandes longitudinales blanchâtres, dont les latérales sont peu distinctes."

Finally, Bartlett [1]) enumerated among other Mammels from Madagascar, *Ericulus nigricans*, inhabiting Tamatave, but as he added no description at all, nobody can make out what he meant, without having seen his type specimen: perhaps it was a slip of the pen and was his example the *Ericulus nigrescens*, Geoff.

Now recapitulating the foregoing, we may distinguish the following genera and species of Hedgehogs, found in Madagascar.

A. *Setiger* [2]), Etienne Geoffroy St. Hilaire — 1803.

$$\text{I. } \frac{2-2}{2-2}. \text{ C. } \frac{1-1}{1-1}. \text{ P. M. } \frac{3-3}{3-3}. \text{ M. } \frac{3-3}{3-3}.$$

Resembles externally the common European Hedgehog. No streaks nor bands on the back. No crest.

1. *Setiger setosus*, Schreber — 1778.

Upperparts of head, from a line drawn between the eyes and ears, of back, sides of the body and upperparts of thighs furnished with harsh quills; they are, however, not so harsh as in the common Erinaceus. Head, throat, breast, belly and legs are almost naked, sparingly covered with soft and rather short hairs. Eye-brow hairs and whiskers very long, the longest attaining more than twice the length of the wiskers of Erinaceus europaeus.

Quills greatly differing in hue in the various specimens. Generally the points and bases are white: the youngest

1) P. S. Z. L. 1875, p. 64.

2) Mivart (P. Z. S. L. 1871, p. 73) keeps distinct the genera *Ericulus*, Is. Geoff. and *Echinops*, Martin. *Echinops*, Martin, however was based upon a not fullgrown individual — measuring about 13 c. m. — and therefore the *hindmost molar* in each jaw was still wanting, but it agreed for the rest in all respects with *Ericulus*, Is. Geoffroy, whilst this latter is a synonym of *Setiger*, Et. Geoffroy.

individual — measuring about 10 c. m. — before me, has the bases colored like the rest of the quills, viz. reddish brown, the points being white, but several quills are entirely reddish brown. In our largest specimen — measuring about 22.5 c. m. — all the quills bear a rather narrow subterminal black ring [1]): another individual — measuring 14 c. m. — shows many quills which are black, except towards the base. Another again, of the same the length as the former, has the white quills embellished with a brown subterminal ring. Upperparts of head, hands and feet are covered with smoke brown hairs, the remaining parts of the body being straw colored. Whiskers black, brown or straw-colored. Hairs of the eye-brows black.

Upper jaw. The incisors are separated from each other by intervals, the two middle are the largest, — much more developed than in the other Madagascar Hedgehogs — subcylindrical, perpendicular, and placed at the apex of the jaw; the two other ones are shaped as the former, but less developed in all proportions, though stronger than in the following species. Separated by a small space succeed the canines, simular to the incisors, but longer and bearing a small posterior notch — in very old individuals the incisors too are notched. The molars, separated by a space from the canines, are crowded, which is not the case in the other species.

Lower jaw. The hindmost incisors are the longest, for the rest they are shaped as the other ones and obliquely directed forwards; the canines and incisors are crowded and notched. The canines bear two notches, for the rest shaped like the hindmost incisors, but larger in all proportions. The first false molar is separated from the canines and the other molars by a narrow space. The other molars are crowded.

The muzzle, ears and tail as in the common Erinaceus europaeus.

1) Both this specimen and the following belong to the black variety, introduced by Is. Geoffroy St. Hilaire as a distinct species under the name of *nigrescens*.

Our Museum contains: ten — nine stuffed and one alcoholic — specimens from different parts of Madagascar, viz: from Tintingue, Tamatave, Mouroundava and Mahambo, collected by Lantz, v. Dam and Audebert, and nine skulls.

B. *Centetes*, Illiger — 1811.

I. $\frac{2-2}{3-3}$. C. $\frac{1-1}{1-1}$. P. M. $\frac{3-3}{3-3}$. M. $\frac{3-3}{3-3}$.

Resembles externally young Porcupines. No streaks nor bands on back or head. Crest well developed.

2. *Centetes ecaudatus*, Schreber — 1778.

Muzzle much more enlarged than in *Setiger setosus*, therefore the head attains nearly half the length of the body — in *Setiger setosus* about one fourth.

Upperparts of head, cheeks, sides of neck, fore-part of back and outside of thighs closely covered with harsh quills, forming on the hind part of the head between the ears an elevated crest. Quills white [1]) or yellowish white with a rather small brown or reddish-brown subterminal ring. Some quills are entirely white. Hind part of back, sides of body and outside of legs furnished with longer flexible bristles-like quills, on the hindmost part of the back gradually passing to very elongated — in the largest individual before me they measure 65 m. m. — undulating bristles which are overhanging the rump and tail. These bristle-like quills and bristles are white or yellowish white colored with a brown or reddish-brown subterminal ring, the extent of the two colors being in proportion to the length of the coverings. A few among them are entirely brown. In the young ones — measuring about 15 c. m. — there are a few short pure white quills between the long bristles and also some entirely brown bristles, much longer than the other ones.

1) The specimens with very long pure white points to the quills and bristles belong to *Centetes armatus*, Is. Geoffroy St. Hilaire, (see o. c. p. 31, pl. 2).

Chin, throat, chest, belly and inside of legs furnished with a few white or dirty white more or less rigid hairs. Naked muzzle, ears, feet and hands brownish black.

Upper jaw. Incisors separated from each other and from the canines; the middle ones are the longest, the others are notched. Canines very strong and long, inclined forewards, without notch. First premolar separated from the canine by a much longer space than that which separates the first premolar from the second; the second premolar much longer and more developed than the first, crowded with the third premolar and other molars which it exceeds in height.

Lower jaw. Incisors not crowded, longer than the upper ones, the foremost pair is the largest, a. s. o., they are all notched. Canines shaped and sized like the upper ones, received into a fossa in the upper jaw. First premolar shorter and less developed in all proportions than the second, separated from the canine by a much wider interval than from the second premolar. The latter exceeds the third premolar and also the molars in height. The two hindmost premolars and the molars also are crowded [1]).

There are now in the Leyden Museum of this species fifteen stuffed specimens, one skeleton and nine skulls, collected by Pollen, v. Dam and Audebert in Madagascar, Mahambo and Maisine, in Nossi be, Nossi faly, Mayotte and Mauritius. The largest specimen measures about 33 c. m., the smallest about 15 c. m.: the largest skull measures 10 c. m., the smallest 6.5 c. m.

C. *Hemicentetes*, Mivart — 1871.

$$\text{I. } \frac{3-3}{3-3}. \text{ C. } \frac{1-1}{1-1}. \text{ P. M. } \frac{3-3}{3-3}. \text{ M. } \frac{3-3}{3-3}.$$

With white streaks or bands on the back. Crest well developed.

1) For more details I refer to P. Z. S. L. 1871, Mivart, "on Hemicentetes.'

3. *Hemicentetes madagascariensis*, Shaw — 1800.

Muzzle elongated simular to Centetes ecaudatus. Head also attaining about half the length of the body.

Upperparts of head covered with rather short quills, on the neck forming an elevated crest. These quills are white with a brownish black subterminal ring. Above the eyes there is a white patch, below them a black one.

The body is ornated with five white lines, the middle forming a kind of rather broad band from the crest to the tail. These lines consist of pure white quills.

In the *young* ones — measuring about 10.5 c. m. — the back between the white streaks, the sides of the body and outside of legs are furnished with short flexible quills and much more elongated bristles, these bristles and quills being uniformly of a dark blackish-brown color.

In the *old* ones — measuring about 23 c. m. [1]) — there are also flexible quills and large bristles on the back between the white streaks and on the sides of the body, but here the quills are white with a subterminal brownish black ring, passing to longer and brownish black or entirely white colored bristles towards the hind part of the back and the outside of legs.

In *all* the specimens there are between the quills and bristles on the sides of the body and outside of legs irregularly spread a few pure white quills. Cheeks, chin, throat, breast, belly and inside of legs sparingly covered with rather rigid whitish hairs. Whiskers blackish brown projecting beyond the ears.

Naked muzzle, ears, hands and feet dirty yellow or brown colored.

Upper jaw. — Incisors separated from each other: the second incisor is slightly curved and notched. Canines

1) Our oldest specimen of this species therefore is about 8 c. m. larger than the youngest of the *Centetes ecaudatus* (see above), which should be noticed as being of the highest importance!

well developed, curved and inclined forewards, separated from the incisors by a wide space. Still wider is the interval between the canine and the first premolar which is very strong, provided with a single notch and higher than the second, which is placed at a short distance from it and rises but a little above the third premolar and the other molars.

Lower jaw. — The four middle incisors horizontally inclined forewards, closely crowded. Second and third incisor provided with a notch. Canines shaped and sized like the upper canines. They are received into a fossa in the upper jaw. Distance between the canine and first premolar twice the distance between the canine and hindmost incisor. First premolar more developed in all proportions than the second, and like these provided with two notches. The first and second premolar are separated by a distance as large as that between the canine and hindmost incisor. Second premolar a little higher than the third premolar and other molars which are crowded. (See Mivart, o. c.).

Of this species we possess six stuffed specimens, four preserved in alcohol and four skulls, collected by Pollen, v. Dam and Audebert, in N. O. and N. E. Madagascar and in Réunion.

4. *Hemicentetes variegatus*, Et. Geoffroy St. Hilaire — 1803.

Head exceedingly elongated, much more than in *Hemicentetes madagascariensis*, attaining about a third of the length of the body; muzzle tapering anteriorly, nakedish.

On the middle of the head is a yellow streak, on the back there are three simular streaks. In the individuals which agree with *le jeune Tanrec*, Buffon, the streak on the head uninterrupted [1]) passes to the streak on the middle

1) Et. Geoffroy St. Hilaire, o. c. says, "dessus du corps orné de trois lignes blanches jaunâtres; celle du milieu s'étend du bout du museau à l'anus. Le pelage est mêlé de soies et de quelques piquans."

of the back (I have five specimens before me). In the *Tandrac*, Buffon (supp. T. VII, p. 301, fig. LXXVI), however, there is a very small whitish line on the middle of the head, abrupt near the base of the crest, nor is the streak on the middle of the back continuous (we possess a single specimen). As there are still more differences in coloration, I will describe this individual by itself as a variety of the *Hemicentetes variegatus*.

The foremost quills of the crest, the quills, bristles and soft hairs on the head marked off by a line drawn from the base of the ear to the corner of the mouth, sides of the neck, posterior upper half of the sides of the body, parts between the yellow streaks on the back, coverts of the haunches and outside of legs, are intensely black. The rest of the quills of the crest, the uninterrupted band along the middle of the head and back, the two other bands anteriorly curved towards the spine, the anterior and posterior lower half of the sides of the body, are uniformly yellow. Cheeks, chin, throat, chest, belly and inside of legs covered with rather soft yellow hairs. Muzzle, ears, short whiskers, hands and feet blackish.

As to the dentition it will suffice to copy Mivart's very accurate description of the teeth of *Hemicentetes madagascariensis* (lege "*variegatus*"). "The *upper* incisors on each side are all separated from each other and from the canine; and the first upper incisor is also separated by an interval from its fellow on the opposite side. The first two incisors on each side are of nearly the same size and shape. Each is conical, pointed and much hooked, with a very large posterior lobe. The third incisor is much shorter, gradually broadening downwards from the socket to the distal edge. The canine is shaped like the first two incisors, but rather larger and with the posterior lobe relatively smaller. It is very much smaller, relatively as well as absolutely than in *Centetes*, I add "and in *Hemicentetes madagascariensis*". — The first premolar, in shape and size, is very much like the canine, though separated from the latter by an inter-

space, which is about three times as long as that which divides the canine from the third incisor. The second premolar is separated from the first premolar by an interval still greater than that which divides the first premolar from the canine. It has a posterior talon, but no internal cusp. The third premolar is nearly contiguous to the second; it is much simpler than is the homologous tooth in *Centetes*. All the molars are contiguous to each other and to the third premolar.

In the *lower* jaw the six incisors are much closer together than are those of the upper jaw. This is less due to their inplanation than to the lateral expansion of their crowns. They are less vertically extended than are the upper ones, and each expands upwards from the root to the cutting-edge. The canine is very much smaller, relatively as well as absolutely, than in *Centetes*, I add "and in *Hemicentetes madagascariensis.*" It is *not* received into any fossa in the upper jaw. It is a much curved conical tooth, with a considerable posterior cusp at its base. The first premolar, in size and shape, is quite like the canine in front. It is separated from the latter by a considerable interval."

I add to the above description: the second *lower* premolar is separated from the first and third by an interval as great as that which divides the first premolar from the canine. The third premolar is placed at a short distance from the molars, which are closely crowded. The premolars do not exceed the molars in height.

Generally the dentition of this species is weaker and much less developed in all proportions than it is in *Hemicentetes madagascariensis*. In comparing the skulls of a specimen of *Hemicentetes madagascariensis* measuring 10.5 c. m. — with that of a specimen of *Hemicentetes variegatus* measuring about 17 c. m. *one would believe the latter to be a young specimen of the former species.*

We possess of the above described species: one stuffed specimen, four preserved in alcohol — the smallest mea-

sures about 9 c. m. — and two skulls, gathered in different parts of Madagascar by Crossley and Audebert.

5. *Hemicentetes variegatus*, var. *buffoni*, Jentink — 1879.

I have before me a specimen — measuring about 14 c. m. — and agreeing in all details with the description given by Buffon, l. c., of his *Tandrac*, which measured 5.8 c. m. — and was therefore a very young one. The general shape of our individual is that of *Hemicentetes variegatus* with which it also agrees in dentition as well in number as in shape and size of teeth. But the differences in coloration are very great.

On the upper parts of head and body predominate two colors, viz: black and whitish straw-yellow. The belly is yellow passing to a more brownish color towards the chest, throat and chin. Upper parts of head, except a *small* streak on its middle, black: the *small* streak on the head is yellow, attenuated towards its extremities and *ends near the base of the crest.* Elevated crest, neck, a triangle on the foremost part of back, a large oval patch on the spine from the middle of the back to a point between the haunches, and a broad streak on each side of the body, curved upwards on its fore-part towards the spine at a distance of 6 lines and also curved upwards on its hindmost part towards the end of the large oval patch, but without touching it and downwards to the root of tail, are uniformly of a straw-yellow. The middle part of the back, between the ends of the upwards curved side-streaks, a broad ring around the large oval patch on the back, the sides of neck, the coverings of shoulders passing to an *uninterrupted* broad streak along the sides of the body, beneath the yellowish side-streaks, and along the outside of the legs, are colored entirely black.

On the upperparts of the body the greatest part of the hairs is woolly; irregularly spread are rather harsh quills

and short rigid hairs. Crest consists on its hind part of elongated woolly hairs, on its foremost part of large rigid bristle-like quills. The headcoverings are rigid hairs.

On the underparts of the body the fur consists of woolly hairs and longer stiffer ones.

Muzzle, ears, hands and feet brownish black.

Of this variety we have a single specimen and its skull; the individual was captured by Crossley on his journey in Madagascar.